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Fall 1995, *Special Dickinson Issue*

TNRCC Galveston Bay Program

Trained Volunteers Test Bayou Waters

By Helen Drummond, Galveston Bay Program Water Quality Team Leader

Dickinson Bayou is designated for contact recreation and is highly utilized for various water sports, including water skiing, jet skiing, wind surfing and swimming; however, due to elevated fecal coliform bacteria, it is not supportive of its designated use.



Willis L. Griffith records water quality data at Paul Hopkins Park on the edge of Dickinson Bayou

The contact recreational standard for fecals is 200 colony-forming units per milliliter. The Galveston Bay

Program characterization studies have found fecal levels averaging 445 colony-forming units per milliliter in Dickinson Bayou. While actual concentrations may fluctuate during various meteorological conditions, more often than not area residents who love and use this waterway are unaware of the potential health risks involved. A goal of the *Galveston Bay Plan* is to raise public awareness of this problem and to increase citizen participation in the protection of this recreational resource.

(Photos by Galveston Bay Foundation)

See Related Story on Page 3

To achieve this goal, a Citizen's Monitoring Program was developed to provide an increase in water sample locations and sample frequency.

The Galveston Bay Program contracted with The Estuarine Sampling Team (TEST) of the Galveston Bay Foundation to conduct citizens' monitoring activities as part of the Dickinson Bayou Demonstration Project. The Galveston Bay Foundation was chosen as the contractor because it has an established, comprehensive citizens' monitoring program that has successfully demonstrated the capability to coordinate efforts with other entities monitoring the Galveston Bay System.

The Galveston Bay Foundation coordinated volunteer efforts to collect basic water quality informa-

(continued on page 3)



Performing tests for dissolved oxygen (DO), from left, are Richard Gauwreau, Mary Adams, Sam House and Art Lewicki

NOTES FROM THE DIRECTOR

PHASE	1989	1990	1991	1992	1993	1994	1995	1996	1997	
• Planning	Galveston Bay National Estuary Program						9/1/94			
• Interim								9/95		
• Implementation								Galveston Bay Program		

Having successfully completed the planning phase and established an implementation program with legislative support during the interim phase, the Galveston Bay Program is poised to begin implementation of The Galveston Bay Plan in September, 1995.

Shovel To Dirt: Galveston Bay Plan Gets Real

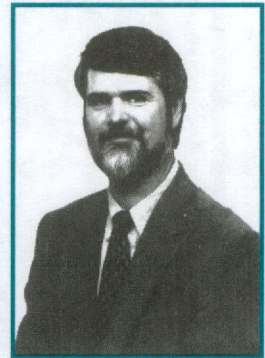
We had picked one of the hottest days of the year and one of the dirtiest, muggiest environments in Texas for our day's work. We came to call the small mud flat along Dickinson Bayou where we labored, "The Mud Hole." Besides mud, the bayou was full of broken bottles and other assorted trash. But by day's end, the broken glass was removed and the previously barren flats were punctuated with sprigs of newly-planted cordgrass and bulrush. We encircled our work with a nutria exclosure - a fence around part of the plantings to keep out the rat-like South American pest. We learned from past projects that nutria can be a major hindrance for wetlands creation in some of the bay's tributaries, due to their taste for wetland vegetation. It seems ironic that having overcome the challenges of achieving political and user group consensus and legislative support for comprehensive bay management, we now face the challenge of a 15-pound rat.

Though the day was hot and muggy, I was far from miserable; instead, I was gratified to be making real, on-the-ground, sweat-in-your-face improvements to this small tributary to Galveston Bay. I began my career as a field biologist, and the field (mud hole or not) still seems to me to be where the real action is. The Dickinson Bayou project - described in the last *Bay Line* and continuing in this issue - is just the first small step in an ambitious program to enhance the value of Galveston Bay by imple-

menting *The Galveston Bay Plan*.

About the time you receive this issue of *Bay Line*, the Galveston Bay Program's official implementation phase begins (see diagram). The Galveston Bay Council - an advisory body of agencies and bay users - will be convened this Fall to guide the effort. Initially, our work in the Dickinson Bayou system will be expanded and continued for another year with some exciting work in Dickinson Bay itself, and formation of new partnerships with local businesses throughout the watershed to reduce the diverse kinds of pollution which enter the bayou during wet weather.

In the coming year, we'll also be working in the larger Galveston Bay region to undertake various initiatives described in *The Plan* - or lend our support to those who are. For example, program staff is helping to develop a plan, conceived by Houstonian Dee Owens, to engage Harris County probationers in marine debris cleanup and other nonpoint source clean-up work in several urban bayous. It's an exciting multi-partner project you'll hear more about in the future. ❖



Frank Shipley

Monitoring Water Quality, Informing Citizens

By Helen Drummond, Galveston Bay
Program Water Quality Team Leader

Nonpoint source pollution cannot be monitored like point source pollution, because stormwater runoff is not treated at a treatment plant to become an end-of-pipe discharge. For this reason, nonpoint source pollution is generally monitored by testing waterbodies and streams themselves, particularly during wet weather.

See Related Story on Page 1

Monitoring of Dickinson Bayou has been performed by citizens as part of the nonpoint source pilot project with the Houston-Galveston Area Council teaming with the U.S. Geological Survey to study the impact of nutrient loadings from stormwater runoff in the Dickinson Bayou watershed. The Galveston Bay Foundation volunteer monitoring activities were used to assess the effectiveness of various initiatives implemented in the Dickinson Bayou Watershed and to determine general water quality conditions.

Volunteers collected basic water quality information such as the amount of dissolved oxygen and clarity. Their monitoring activities were expanded to include measurements for fecal coliform bacteria.

Bayou Waters (continued from page 1)

tion including temperature, dissolved oxygen, pH, conductivity, and Secchi depth (turbidity). The Galveston Bay Foundation also expanded the scope of its current volunteer monitoring activities to include fecal coliform bacteria measurements. Fecal coliform bacteria are indicators of sewage pollution or other contamination from humans, birds or mammals.

In addition to fecals, nutrients also have been identified as a potential problem in Dickinson Bayou. To assess the impact of nutrients, the Houston-Galveston Area Council is continuing to perform studies to determine the loadings from stormwater runoff in the watershed. As part of the Galveston Bay Program project, the Galveston Bay Foundation participated in cooperative efforts for nutri-



Louis S. Munson and Frank L. Wood perform dissolved oxygen (DO) tests at the Hwy. 3 Boat Ramp
Galveston Bay Foundation Photo

Dissolved oxygen is one of the most common and important parameters measured. It is the traditional and universal indicator of aquatic health. Dissolved oxygen is needed to support the propagation of fish, enhance recreation and reduce the possibility of odors caused by decaying organic matter - often caused by excessive growth of algae resulting from overfertilization.

Turbidity is the converse of water clarity - referring to the attenuation of light caused by cloudi-

(continued on page 8)

ent monitoring. Nutrient testing was performed in conjunction with a certified laboratory and, as part of this phase of the project, the reliability of field nutrient kits was investigated.

Monitoring activities were concentrated at 16 different sites at frequencies (at least once a week) sufficient to gather data on water quality changes during both dry and wet weather conditions. Seventeen volunteers from the Dickinson area were recruited for this project. They included: Mary Adams, Cindy Caudill, Dennis Doherty, Richard Gauvreau, Will Griffith, Malcolm Hicks, Sam House, Art Lewicki, Graeme Marston, Kelly Matson, and Louis Munson. Also, Ingrid Norris, Cathy Pierpoline, Sandra Smith, Richard Weeks, Frank Wood and Robert White. These volunteers were trained by the Galveston Bay Foundation staff in conducting scientifically valid sampling and testing procedures.

Dickinson Bayou, Paul Hopkins Park Scene of Plantings

By M.A. Bengtson, Galveston Bay Program Public Participation Director

Neither heat nor mud nor aching backs could quell the enthusiasm of volunteers who tackled habitat restoration and erosion control projects in Dickinson's Paul Hopkins Park in late July.

Helen Drummond and Cynthia Jennings, Galveston Bay Program's team leaders for water and habitat, coordinated the restoration project. Ten volunteers from the Pearland Neighborhood Centers, and staff from Galveston Bay Program, the General Land Office and U.S. Fish & Wildlife Service (USFWS) spent an entire day working on the project.

In a mud flat below the park's boardwalk, clumps of smooth cordgrass (*spartina alterniflora*), California bulrush (*scirpus californicus*) and salt marsh bulrush (*scirpus robustus*) were planted to determine if these varieties can be successfully used for habitat restoration in Dickinson Bayou.

The California bulrush plants were transplanted from the Brazoria National Wildlife Refuge. Salt marsh bulrush came from a site on NASA Road 1 in Clear Lake where highway construction is slated. And, the smooth cordgrass was provided by the AmeriCorps project at Cedar Bayou, a program of the Natural Resources Conservation Service.

Bryan Pridgeon, biologist with USFWS, said, "At this location in Dickinson Bayou you have variable habitat conditions as to water elevation and levels of salinity. For example, the salinity level can range from zero to 20 ppt. These species were selected because they bracket the range of environmental conditions."

Tom Calnan, a coastal biologist with the General Land Office, said, "Because this

project is experimental in nature, we are hoping that this test will be successful and that one or more of these species will survive. This will assist us in determining which species are best adapted for Dickinson Bayou."

An additional aim of the project was to determine if nutria - a problem for some previous wetlands creations projects - are likely to hinder the work on Dickinson Bayou. Nutria are beaver-sized mammals from South America which were imported to Louisiana for fur farms, escaping to become pests throughout the deep South. A fence was erected to keep the nutria out of one portion of the test plot and, for later observation.



Cynthia Jennings of the GBP staff directs retrieval of California bulrush from Brazoria National Wildlife Refuge for transplanting in Dickinson Bayou



Teen volunteers from the Pearland Neighborhood Center planted three types of marsh grasses adjacent to the park's boardwalk



Hardy Asian jasmine was planted in the Park to slow the flow of water to the Bayou and reduce erosion and bayou contamination

In another phase of the Paul Hopkins Park project, nonpoint source pollution and erosion were targeted. Helen Drummond said, "In the park itself, areas below two stormwater drains were targeted for erosion abatement. With the assistance of crews from the Galveston County Beach Park Board, under the supervision of Planning Director Jake Waldorf, areas below the drains were lined with drainage gravel, and adjacent land was rototilled for the planting of hardy groundcover. With the help of agency staff and our teen volunteers, we

planted 500 pots of Asian Jasmine to help slow the flow of stormwater to the bayou."

Participants from the Pearland Neighborhood Center, led by Glenn Rankin, were Dionicio Solis, J.J. Castillo, Juan Fonseca, Leticia Garcia, Dana Garcia, Nora Salvador, Balentin Saabedra, Luis Lopez and Brenda Gonzales. The teens are students from Alvin and Pearland.

Dr. Frank Shipley, Director of the Galveston Bay Program, noted, "This restoration of habitat, both in Dickinson Bayou and in Paul Hopkins Park, is right in line with the goals of *The Galveston Bay Plan*. Research over the past five years has shown that loss of habitat for juvenile fish and shrimp, and nonpoint source pollution off of our streets and from our storm drains, are two of the major problems affecting the well-being of the Galveston Bay System. For this reason, habitat restoration and control of nonpoint source pollution were given priority status in the drafting of *The Galveston Bay Plan*.

"As we begin the formal implementation process this Fall, you will see an ongoing partnership of agencies and volunteers spread to the entire bay system in order to protect this vital natural resource," Shipley added. ♦

State of the Bay Book Now Available

The *State of the Bay: A Characterization of the Galveston Bay Ecosystem* is now available through the Greater Houston Partnership at cost plus tax and shipping.

State of the Bay is a book published by GBNEP which chronicles the results of many bay studies accomplished over the past five years.

It includes about 230 pages of text, photos, maps and graphics, many of which are in color. The information should be useful to consultants, students, academicians, maritime companies and anyone who is interested in up-to-date scientific data and a comprehensive summary of the condition of the bay and its ecosystem.

The State of the Bay: A Characterization of the Galveston Bay Ecosystem

Please send _____ copies to:

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To order: Mail to Publication Sales at the Greater Houston Partnership,
2 Allen Center, 1200 Smith, Suite 700, Houston, Texas, 77002.

Mail order cost: \$23.82 (tax, postage and handling). Copies may also be picked up at the GHP office main desk for \$18.94 (with tax).



**Phone number:
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Publication List of the Galveston Bay Program

The following publications are available to the public at no charge. You may obtain these at one of the offices listed below.

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711 West Bay Area Boulevard
Suite 210
Webster, Texas 77598
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Texas A&M University, Galveston
Jack K. Williams Library
P.O. Box 1675
Galveston, Texas 77553
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Report Publication Series

Proceedings: Galveston Bay Characterization Workshop	Feb. 1991	GBNEP-6
Christmas Bay Environmental Inventory	Mar. 1991	GBNEP-7
Armand Bayou Environmental Inventory	Mar. 1991	GBNEP-8
Christmas Bay Regulatory Survey (out of print)	Mar. 1991	GBNEP-9
Armand Bayou Regulatory Survey (out of print)	Mar. 1991	GBNEP-10
Fiscal Year 1992 Work Plan	Aug. 1991	GBNEP-11
Shoreline Survey Unpermitted Discharges to Gal. Bay (out of print)	Aug. 1991	GBNEP-12
Armand Bayou Regulatory Effectiveness Study	Dec. 1991	GBNEP-13
Christmas Bay Regulatory Effectiveness Study	Dec. 1991	GBNEP-14
Characterization of Nonpoint Sources and Loadings (out of print)	Jun. 1992	GBNEP-15
Wetland Plant Communities, Gal. Bay System	Mar. 1992	GBNEP-16
Fiscal Year 1993 Work Plan	Aug. 1992	GBNEP-17
Segmentation Development for Gal. Bay	May 1992	GBNEP-18
Characterization of Selected Living Resources in Gal. Bay	Jun. 1992	GBNEP-19
Toxic Contaminant Characterization of Aquatic Organisms in Gal. Bay	Jul. 1992	GBNEP-20
Characterization of Selected Public Health Issues in Gal. Bay	Aug. 1992	GBNEP-21
Ambient Water and Sediment Quality of Gal. Bay	Aug. 1992	GBNEP-22
Proceedings: The Second State of the Bay Symposium - Feb. 4-6, 1993 (out of print)	Feb. 1993	GBNEP-23
Environmental Management Inventory of Gal. Bay	Oct. 1992	GBNEP-24
Recreational Fishery By-Catch in the Gal. Bay System	Nov. 1992	GBNEP-25
Galveston Bay Bibliography	Apr. 1993	GBNEP-26
Framework for Action: Galveston Bay Management Evaluation	Jan. 1993	GBNEP-27
Dredge and Fill Activities in Galveston Bay	Apr. 1993	GBNEP-28
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Trends and Status of Wetland and Aquatic Habitats in the Gal. Bay System	Apr. 1993	GBNEP-31
Fiscal Year 1994 Work Plan	Aug. 1993	GBNEP-32
Probable Causes of Trends in Selected Living Resources	Sept. 1993	GBNEP-33
Trawling Bycatch in the Galveston Bay System	Aug. 1993	GBNEP-34
Sources & Distribution of Bay Debris in the Galveston Bay Estuary	Aug. 1993	GBNEP-35
Point Source Loading Characterization of Galveston Bay	Sept. 1993	GBNEP-36
The Economic Value of Improving The Environmental Quality of Galveston Bay	Jun. 1994	GBNEP-38
Galveston Bay Data Inventory, Volumes I & II	Dec. 1991	GBNEP-40
Estimated Loadings of Partially Treated Domestic Wastewater on Galveston Bay	Oct. 1994	GBNEP-41
A Conceptual Model of the Galveston Bay Ecosystem	Oct. 1993	GBNEP-42
DRAFT- <i>The Galveston Bay Plan</i> ; A Comprehensive Conservation & Management Plan	Apr. 1994	-
The State of the Bay: A Characterization of the Galveston Bay Ecosystem, is available at cost through the Greater Houston Partnership. (See page 5)	Mar. 1994	GBNEP-44
Regional Monitoring Program For <i>The Galveston Bay Plan</i>	Nov. 1994	GBNEP-45
Implementation Strategy For <i>The Galveston Bay Plan</i>	Nov. 1994	GBNEP-46
Funding Strategy For <i>The Galveston Bay Plan</i>	Nov. 1994	GBNEP-47
Federal Consistency Report For <i>The Galveston Bay Plan</i>	Nov. 1994	GBNEP-48

Videos

<i>Balancing Act (Armand Bayou and Christmas Bay)</i>	Oct. 1990
<i>Oyster Harvesting and Conservation in Galveston Bay</i>	Oct. 1991
<i>Conflicting Uses of Galveston Bay</i>	Oct. 1991
<i>Will Galveston Bay Go Down the Drain?</i>	Feb. 1994

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Composting Wheels—an easy to use “wheel” with helpful information about home composting projects to enrich your lawn and garden without using chemicals that are hazardous to the environment.

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Brazoria County Library System libraries:

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Monitoring Water Quality

(continued from page 3)

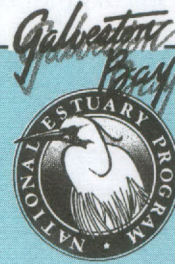
ness from suspended matter, soluble colored organic compounds or plankton in the water; this light is vital for photosynthetic use by aquatic plants and algae. Turbidity is a measurement often used as an indicator of the concentration of suspended matter. Excess suspended solids adversely affect fish by reducing their growth rate and resistance to disease, preventing the successful development of fish eggs and larvae, and reducing the amount of food available. Turbid water also interferes with recreational use and aesthetic enjoyment.

Excessive nutrients, the two most important being nitrogen and phosphorus, pose potential for problems in a system. Common problems brought on by overnutrification are low dissolved oxygen levels and poor water clarity.

Fecal coliform bacteria are used as a primary indicator for determining whether the water has been contaminated by animal or human waste. Although fecal coliforms do not normally cause illness in humans, their presence indicates the potential presence of pathogenic organisms.

Each of these parameters plays a major role as indicators of water quality; however, other parameters such as temperature, pH and conductivity

were also measured. Results of the monitoring activities are being analyzed and assessed for a "Bayou Barometer," an informative tool representing the water quality of Dickinson Bayou. The Barometer will be published to inform citizens of the general health and condition of their area waterway, which will allow the local community to make informed decisions concerning its use. ♦



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